

IN MEMORIAM: WILLIAM WALLACE NEWBY (1902-1977)

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ABSTRACT.— W. W. Newby, professor of biology at the University of Utah from 1927 to 1971, was reknowned as a great teacher and a clear and forceful writer and for his meticulous research in invertebrate embryology. Ancillary skills were counseling (especially of premedical students), illustrating, wood crafting, and paper preserving. Some of his writings pertained to the history of research in the biological sciences at the University of Utah. His specialty areas in teaching were embryology and genetics, and he served as chairman of the Department of Genetics and Cytology from the year of its creation in 1948 until 1962. The most outstanding example of his research pertained to the early embryology of the echinoid worm *Urechis caupo*.

Among his colleagues at the University of Utah he had the reputation of being one of the finest teachers that the university ever had. This appraisal of his teaching ability was shared by thousands of students whom he came in contact with during a teaching career that spanned 44 years (1927-1971).

He was particularly appreciated by premedical students, since one of the many courses he taught was embryology, part of a sequence of required courses in biology in his time for this group. Early in his professional life he did pioneer research in the specialized field of developmental embryology. In later years he eschewed research in favor of committee work and premedical counseling, in which activities he again made significant and prolonged contributions. He served as head of a newly created Department of Genetics and Cytology from 1948 to 1962.

He liked to work with his hands and make things. One of his attributes was a remarkable skill in drawing and preparing illustrations for his own research reports and numerous laboratory manuals. He was also an expert wood craftsman.

Upon his retirement in 1971, at which time he received a distinguished teaching award and the honorary rank of professor emeritus of biology, President James C. Fletcher characterized Dr. Newby as one who was "always willing to go the extra mile not only for students but for colleagues as well." Upon retirement he continued to work at the university as

a volunteer in the library, serving as a specialist in paper preservation and restoration.

The following resumé of Dr. Newby's life and work not only elucidates his career and



Fig. 1. William Wallace Newby.

pays tribute to the man, but also touches on the history of the University of Utah, with which he was affiliated for 50 years. He was one of the outstanding scholars who helped make it the great institution that it is.

William Wallace Newby was born in Dayton, Ohio, on 17 September 1902, the son of William Wallace and Emelia Vornholt Newby. His father was a photoengraver and moved several times through the midwest fol-

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lowing this trade. The family lived for several years in Norwood, Ohio, near Cincinnati, where young W. W. Newby received his early education in the elementary schools. (He received a certificate for good penmanship while in the third grade.) He recalled seeing the last passenger pigeon in the Cincinnati Zoo and was greatly impressed that a thousand dollars had been offered for a mate in the hope that if one were found the pair would propagate and save the species, but the effort came too late.

The family next moved to Kansas City, Missouri, where Newby attended Westport High School from 1917 to 1920. He had a natural aptitude for working with his hands, so as a freshman (his ninth year) he took a course in carpentry shop and made a book shelf, table, and couch. This was prophetic of his working up to bigger and better things. The next year he took a course in pattern making that involved the preparation of sand castings of iron and brass. His good work in these classes led to a job in the summer of 1918 making wooden propellers for airplanes used in World War I. His third year he took machine shop, which gave him experience in forging and shaping metal, but he preferred woodworking over metalworking. The fourth year of high school he repeated carpentry shop just to have a place to work so he could continue to make various items of furniture for the family home.

High school was followed by two years (1920–1922) attending Kansas City Junior College. During his last two years of high school and the two years in junior college, he held several jobs after school and on Saturdays in various shops, big and little, in Kansas City. He worked one summer on a surveying crew mapping a portion of the Missouri River. He was active in the Boy Scouts, and during the summer after junior college, as an assistant Scout executive, he helped run a Scout camp at Noel, Missouri, in the Ozark Mountains. The next summer he assisted at a camp at Pleasant Hill, Missouri, for underprivileged boys from Kansas City. His supervisors urged him to continue in counseling work with them, but he was offered a position at the Haskell Institute, which was one of the federal boarding and training schools for Indian children. The buildings for the education complex were situated on the campus of the Uni-

versity of Kansas at Lawrence. He had charge of the smaller children and received board and room plus a salary of \$25 per month. Occasionally he would bring a carload of children to Kansas City to see the sights and attend a movie. The group slept on the floor of his mother's living room. In return, the children painted tribal symbols on a tanned deer skin which they presented to him.

During the academic years 1924–1926, he was a student at the University of Kansas at Lawrence. During this time he became interested in fencing and developed proficiency in the sport, winning a medal at one special event and being elected vice-president of the Fencing Club. He joined the DeMolay organization, which led to his joining the Masons. He was active while at Kansas and for his first year in Utah, but, as responsibilities of academic life increased, he gradually became inactive.

At the University of Kansas he initially planned to go into engineering but instead switched to zoology, probably being influenced by Dr. H. H. Lane, who was the head of that department. Newby served during his senior year as president of the Zoology Club. He focused on mammals, especially rodents, doing some collecting and preparation in the field with follow-up museum curatorial work. He obtained the A. B. in 1926. By this time he had decided he wanted to teach for his livelihood and thinking that a master's degree would enhance his chances of obtaining a university position, he next went to Iowa State College (later Iowa State University) at Ames, Iowa, where he had been offered a teaching assistantship. His major professor there was George O. Hendrickson and his thesis problem pertained to rodents. He completed the required course work and did his research during the regular 1926–1927 academic year and wrote his thesis during the following summer. The M. A. degree was awarded him in 1927.

During the spring of 1927, being reasonably sure that he could finish his work at Ames by the end of the summer term, he commenced looking for a teaching position and received offers from three institutions: Lawrence College in Appleton, Wisconsin; Christian College, a girl's school in Columbia, Missouri; and the University of Utah. He

chose the latter. For one thing, it was a university rather than a college. It was also the farthest west of the three institutions and hence closest to the Pacific Ocean. Apparently he harbored a latent interest in marine life and a desire to work sometime in a marine laboratory. Furthermore, Utah was situated in the intermountain region, and he had never experienced mountains. Here his ever present curiosity about nature was manifest, but there was also a fortuitous element involved. The head of the Department of Zoology at the time was Harold R. Hagan, who was a friend of Dr. Hendrickson at Iowa State. Dr. Hendrickson had taught in Utah at one time. In a letter to him Dr. Hagan appended a note saying "We have an opening. Do you have anybody?" The opening was occasioned by the resignation of David T. Jones. Newby was told of the position and immediately wrote to Dr. Hagan. Before anything was finalized, Hagan became seriously ill and was replaced as department head by Dr. Ralph V. Chamberlin. It happened that Dr. Chamberlin was a friend of Dr. Lane at Kansas, whom Newby had suggested as a reference. Also Chamberlin was searching for a mammalogist, which Newby was at the time. So Newby was selected for the position. He arrived on the University of Utah campus about a week before the autumn term started for the 1927-1928 academic year. He rented a room from Professor and Mrs. F. F. Hintze near the campus but went elsewhere for his meals. Dr. Hintze was in the Geology Department, which was then housed along with biology in the Museum Building.

Newby's teaching assignment that first year was strenuous, especially for a person with little experience and virtually no time for prior preparation. It consisted of three classes per quarter, and they were large-sized classes. The first term he had two sections of genetics and one of invertebrate zoology. The genetics sections continued through the next two quarters, but the zoology changed. Winter quarter he taught comparative anatomy of vertebrates. This was followed spring quarter with a class in ecology. The second year the pressure eased a little, because the schedule was the same. The writer was a member of Dr. Newby's second winter quarter comparative anatomy class in 1928. I was impressed with

his youthful appearance, friendly personality, enthusiasm for the subject matter, and his teaching effectiveness. A year or so later I took an advanced genetics class from him.

When Dr. Newby arrived on the University of Utah campus, the Biology Department occupied the second floor of the building on the lower campus then known as the Museum Building. Later it became the Biology Building, then the North Biology Building (when a "South" Biology Building was built), and finally the James E. Talmage Building of today. The Geology Department was on the ground floor, and the top floor was mostly a large, open, high-ceilinged hall that served as an auditorium for assemblies, lectures, and plays. There was a stage at the east end, and folding chairs were used. Some classrooms at the west end were used mostly by the Psychology Department.

As the biology area was growing rapidly under Dr. Chamberlin's leadership, he anticipated that before long more space would be needed. Soon after Newby's arrival, Dr. Chamberlin, knowing of Newby's manual dexterity and shop work experience, asked him one day if he knew how to make blueprints. When Newby replied yes, he was given the assignment of drawing up plans for the division of the open space on the top floor into classrooms, laboratories, and offices. Dr. Chamberlin wanted something tangible to show to President Thomas so as to "sell" the administration on expanding quarters for biology. This approach was successful and the remodeling was subsequently done according to the plans that Newby drew up, even to the extent of using his blueprints without the further aid of an architect.

Biology got all the space on the top floor except that previously assigned to psychology. Eventually, biology crowded out both psychology and geology and took over the entire building, which then became known as the Biology Building. Every time after that, when alterations were made on the structure, Newby was consulted since he knew where the bearing walls and other architectural features such as lowered ceilings were located. Ironically, the top floor was partly opened up again in Newby's later years when certain partitions were torn out and the two large rooms

at both the east and west ends were converted into large classrooms for teaching by television.

Another project he did soon after his arrival was to make wooden models to illustrate all the changes in chromosomes during the stages of mitosis or cell division. Indeed he made duplicate sets, since there were often several sections of the genetics course. Later he prepared large drawings showing the differences between regular cell division and the reduction division that occurred in the production of gametes. The comparable stages were arranged side by side to show the contrast. He also prepared charts comparing spermatogenesis with oogenesis. These aids were tremendously effective and came at a time when such items could not be easily purchased from biological supply houses.

Newby's father died on 6 November 1927, not long after Newby had arrived in Utah. His mother and brother decided to join him out West. He rented an apartment for them, and they made the move just before Christmas.

One of the people in the Biology Department when Newby arrived was Elizabeth Johnson, a student at the university whose home was in Midway, near Heber City. She was working at the time for board and room at the home of Professor and Mrs. Joseph Merrill of the Engineering Department. Dr. Dolly Lutjeharms, who was then assistant professor of botany, also lived with the Merrills. Through this connection Beth gained employment in the Biology Department doing some secretarial work but mostly serving as a reader for examination papers for Dr. Chamberlin's courses in zoology and evolution. (She must have graded some of the examinations of the writer, for I took all of Dr. Chamberlin's courses).

Newby's almost daily contact with her led to a romance. She had been addressing him formally as Mr. Newby. One day he suggested that she call him by his middle name, Wallace—apparently he didn't care for his first name, William, or the nickname Bill. It seems she had an aversion to the name Wallace, however, so she started calling him Kim, which name stuck. They were married on 7 June 1928 at her home in Midway. They had one daughter, Navee, who specialized in nutrition at the University of Utah, later mar-

ried, and moved east. She is employed as a nutritionist with a government food supplier.

Kim retained his youthful appearance all through the years. People who knew him for a long time often remarked how little he changed. This and his always being impeccably dressed made him seem eternally youthful. He especially liked to wear bow ties, and he had a penchant for many styles of shoes.

Kim came from a deeply religious Baptist family; his great grandfather had built a handsome Baptist church in Seymour, Indiana. So Kim affiliated with the First Baptist Church in Salt Lake City. An incidental point, going back to his University of Kansas days, is that in his early years on the University of Utah campus he and Professor Joseph Smith used to fence together. They were the only two on the faculty who knew this sport. Later Kim fenced with a medical student Marcell Marquis, an experienced fencer and organizer of fencing clubs. Kim eventually gave up fencing, again because of his teaching responsibilities.

Having arrived at the University of Utah with a master's degree, Newby next set a goal to obtain the doctor of philosophy degree. In keeping with his long-standing desire to see the ocean and study marine life, he decided to attend Stanford University's marine station at Pacific Grove near Monterey, California. In the meantime, Stephen D. Durrant had moved into the field of mammalogy, and Dr. Chamberlin wanted Newby to specialize in experimental biology.

The Newbys first went to the marine station in the summer of 1930. Kim bought a Model A Ford and, with Beth and Navee, who was then only about 10 months old, journeyed across western Utah and Nevada on graveled roads, taking three days to reach Pacific Grove. He took three marine invertebrate courses that summer.

His destiny turned from the planned experimental biology specialization to developmental morphology when he elected to study the early development of a marine worm *Urechis caupo*, an unpretentious denizen of the mud flats of the intertidal zone. His interest in *Urechis* was initially aroused by contact with Professor G. E. MacGinitie, who was one of the describers of the species, but it was Dr. Harold Heath who pointed out the need for studies on the embryology of invertebrates in

general and the suitability of the eggs and larval stages of *Urechis* in particular for such studies. Newby started his research under Professor Heath. His first publication (1932) dealt with the early embryology of this worm. When Heath retired in 1933, Newby continued his work under Professors Douglas M. Whitaker and Tage Skogsberg. Whitaker became chairman of Kim's graduate committee. After three summers at Pacific Grove, Kim spent a full academic year, 1933-1934, on the main Stanford campus at Palo Alto continuing his research, taking further course work, passing the qualifying examinations, and starting the writing of his dissertation. He obtained the Ph.D. in 1939.

Dr. Whitaker was greatly impressed with Newby's meticulous morphological work and cell lineage studies and envisioned that his research would accentuate the relatively new specialty area in experimental embryology whereby particular cells could be marked at critical stages and the results of many generations of cell divisions subsequently traced with great precision. He stopped off in Salt Lake City one time on his way east to urge Kim to expand his research. Kim did so, even though it delayed completion of the dissertation. Later Dr. Whitaker arranged for the results to be published in the memoirs of the prestigious American Philosophical Society (1940). The book was illustrated by 85 of Newby's superb original drawings. With publication of the book, many co-workers in embryology wrote to Dr. Newby complimenting him on his fine, meticulous contribution. Among those who did so were such illustrious people as E. G. Conklin, J. Frank Daniels, and E. D. Goldsmith. Dr. Skogsberg was especially lavish in his praise of Kim's work being an original contribution. Kim was mentioned in the *Encyclopedia Britanica* in connection with his work on *Urechis*.

Dr. Newby's embryological study contributed to taxonomy in that it helped establish the echiuroid group of worms as a separate phylum according to some authorities. A sequel paper (1941) was concerned with the development and structure of the slime-net glands of *Urechis*. Several years later (1946) Dr. Newby made a similar study of the slime glands and thread cells of the hagfish *Polistrotrema stouti*, one of the Cyclostome or jawless

fishes. The material was furnished by Rolf Bolin, an associate at Hopkins Marine Station and a former Utahn, whose father taught physical education at the University of Utah. (Incidentally, Newby's colleague Seville Flowers bought the Bolin residence near the campus).

A carryover from the Stanford period was that Newby established in one of the laboratories in the Biology Building at the University of Utah an aquarium for marine invertebrates for teaching purposes. He brewed up salt water with the same constituents as the ocean and obtained sea anemones, starfish, and other marine organisms from Dr. Bolin, who collected them along the Pacific Coast. This effort was not long sustained because of the difficulties of continuously providing the proper environment for species whose habitat was the intertidal zone, especially during the long summers when no classes in invertebrate zoology were given.

The momentum and stimulus of his research for the doctorate motivated Newby for several more years. For the 1941-1942 academic year he took a sabbatical leave to become research associate professor at the University of Texas. He worked with Dr. J. T. Patterson and his team studying development in the fruit fly *Drosophila*. The approach was to first study the development of normal *Drosophila* larvae as a basis for comparison with larvae of strains possessing structural or biochemical abnormalities. One paper by Newby (1942) soon appeared dealing with intersexes produced by a dominant mutation in *Drosophila viridis*. Some years later a second paper (1949) dealt with abnormal growths on the head of *Drosophila melanogaster*.

About the time the Newbys arrived in Texas, war clouds were gathering, and the United States soon became actively engaged in World War II. At Texas, Kim was approached by U.S. Army recruiters about taking part in a new high-altitude aviation physiology program of research and instruction of pilot trainees. It was hinted that if he signed up his initial rank would be that of captain. Being a patriotic and compulsive individual, Kim enlisted but strangely didn't discuss the matter with his wife. After only one full quarter of resumed teaching at the University of Utah, autumn quarter 1942, Beth was

shocked to receive a telephone message coming to the house that Second Lieutenant Newby was to report for duty on a certain date in February 1943, and that his assignment was in the Aviation Corps of the U.S. Army.

He obtained a military leave from the University and spent the next three years or thereabouts in a new phase of his career in the Army. He had short initial assignments at Randolph Field in Texas and at an air base near Philadelphia, followed by about two years at Santa Ana Army Air Base in California. The last year he was stationed at Nellis Air Base at Las Vegas, Nevada, where he was attached to the hospital unit and taught night vision. Also he was an instructor in high-altitude physiology in the basic training program, utilizing chambers specially designed for that purpose. He received commendation for the high calibre of his work, his effectiveness as an instructor, and for his many other contributions to the success of the ground training program—and he was promoted to the rank of first lieutenant. While Newby was in the army, the writer taught one of his courses at the University of Utah, namely, vertebrate embryology, which was taken mostly by pre-medical students in the Army Specialized Training Program.

Upon Newby's release from the army in September 1945, he once again resumed his teaching duties at the University of Utah. While on military leave he had been advanced to full professor rank. Promotions and salary raises came slowly during the time that Dr. Chamberlin was head of the Biology Department. In Newby's case he was an instructor from 1927 to 1934 and assistant professor from 1934 to 1939. Having obtained the doctorate in 1939, he was promoted to associate professor that year, which rank he held until 1945 when he became a full professor. It is not clear whether Dr. Chamberlin offered the promotion to get Kim to return to Utah or whether Dr. Newby made that a condition of his return. In any event, Dr. Chamberlin visited Kim while he was stationed in Las Vegas.

Unfortunately for the science of developmental embryology, the long period of military service interrupted Newby's research and seemingly lessened his desire to do more of it. Furthermore, when he returned to Utah, classes in the postwar period were very

large, and numerous sections were held to accommodate the great influx of postwar students. Hence teaching loads for instructors in the department increased. I recall one quarter when Kim had three laboratory sections for his embryology course going at the same time. Although he had teaching assistants for each, he was continuously rotating between them up and down stairs many times an afternoon.

Still another factor was that he was now one of an intermediate group of professors on whom committee work rested heavily. Among the more important of his committee assignments was the involvement of serving many years on the Scholarship Standards Committee, including two years as chairman; being on the Committee on Academic Freedom and Tenure; and serving on the Faculty Council. In addition, he served many years on the Academic Board of the U.S. Navy unit on campus.

All were time-consuming and tension-producing assignments carried in addition to a full teaching load plus administrative duties. All this reduced time for research. Being a conscientious individual, he would not shirk other duties to do research so the latter had to suffer. He remarked once that some staff members could teach, serve casually on committees, and still do taxonomic research, but that with his type of research he couldn't and wouldn't. He felt that it was a decision forced upon him that he had to give up research. During the summer of 1949, Dr. Newby taught a course in embryology at Stanford University.

Several years after the strenuous postwar interval, another responsibility was thrust upon him in connection with a new advanced placement program designed to identify gifted students in high school and allow them to enter universities even before their graduation from high school. This was a coordinated statewide movement, and Dr. Newby was selected to serve as director of advanced placement at the University of Utah. Working with Dean Sydney W. Angleman and the general education board, he was responsible for developing a curriculum, counseling students, some as young as 15 years of age, and synchronizing the university's program with that of

other institutions in the state. He served in this capacity from 1965 to 1969.

Another development in which he was vitally involved was a reorganization of the Biology Department. Although the catalog indicated for many years that there were two departments in the biology area, botany and zoology, in reality there was but one large Biology Department, with Ralph V. Chamberlin as head. Most members of the professorial staff retired in those days at age 65, but Dr. Chamberlin evidently had an understanding that he could continue to 68. As his retirement approached, there was considerable discussion concerning a departmental reorganization.

Dr. Newby led one faction, urging retention of a single integrated biology department with a new chairman being brought in from outside the university. Supporting this position were the writer, Walter P. Cottam, Elden J. Gardner, and several others.

Taking a different position were doctors Chamberlin, Rees, Woodbury, and their supporters. Their rationale was that the creation of several departments would lead to greater representation on the Faculty Council and to greater funding from the administration.

The end result was that the Chamberlin group prevailed, and five departments were formed within a Division of Biology. The departments and their chairmen were as follows: Botany, Walter P. Cottam; Invertebrate Zoology, Don M. Rees; Vertebrate Zoology, Angus M. Woodbury; Genetics and Cytology, W. W. Newby; General Biology, William H. Behle.

To establish harmony Dr. Horace Davenport, chairman in the Department of Physiology in the Medical School, was persuaded to serve for a time as chairman of the division. The writer, in addition to heading the general biology, was selected to act as executive secretary of the division and be the liaison person with Dr. Davenport, and I moved into the former office of Dr. Chamberlin, which was centrally located.

The division, with its multiple departments, was an artificial arrangement that seemed to the writer to have been motivated largely to reward several full professors, but it worked for several years because we all wanted it to work and pulled together. In the

many long meetings Kim Newby's sound thinking and composure constituted a steady influence. After three years, Dr. Davenport stepped out, and Dr. Rees became chairman of the division in addition to being department head of Invertebrate Zoology. The writer could see no need for the position of executive secretary any longer, with everything now centralized, so that job was abandoned and Dr. Rees moved into Dr. Chamberlin's old office.

Without going into all the details, eventually a consolidation took place piecemeal over the years, and we were back to one big Biology Department, the situation that Dr. Newby et al. had argued for in the first place. Dr. Newby served as chairman of the Genetics and Cytology Department for 14 years, until 1962. Dr. Vickery then served as chairman of the Department of Genetics for three years, 1962-1965, before another reorganization led to a merger of the Department of Genetics with the Department of Experimental Biology, which had been established in the meantime.

Another phase of Dr. Newby's career to note was his serving as premedical counselor, succeeding the writer in that position. One of his innovations was the preparation of a "Guide for Premedical Students" (1954a). This he personally published, but it had to be sold through the bookstore in accordance with university regulations. Many years later it was revised and reissued, this time in pamphlet form published by the university (1967). A second such aid was called "Becoming a Doctor." It too started as a mimeographed product circa 1956 and was later published as a pamphlet by the university (1965a). It covered a broader scope than just the premedical curriculum at the university, and the realistic advice contained therein was helpful to parents as well as students. For both of these aids he adopted a question and answer format, first posing the question in boldface type, which was then followed by the answer or explanation. Dr. Newby enthusiastically carried on this premedical counseling for 18 years until his retirement. As premedical counselor and instructor in the premedical embryology course, Dr. Newby had the burden, as did Durrant, of writing hundreds of letters of recommendation, no small task. His appraisals of

applicants were highly regarded by medical admissions committees throughout the country as well as at the University of Utah.

Although Dr. Newby had largely forsaken research for these various new assignments, he continued his affiliation with several professional societies. He was a member of the American Association for the Advancement of Science, the American Institute of Biological Sciences, the Genetics Society of America, Sigma Xi, Phi Sigma, Phi Kappa Phi, and the Utah Academy of Sciences, Arts, and Letters. He didn't go to many meetings but did attend the Genetics Congress held in Montreal in 1958. Through the years he had one graduate student who obtained the Ph.D. under him and more than 10 others who received the M.S. or M.A. degrees.

Even though research was essentially behind him and he was overburdened through the years with a heavy teaching load, committee work, and special assignments, Dr. Newby continued to write and be creative. In his teaching, in addition to his carefully prepared lectures, he always stressed laboratory work as a practical learning experience. In the laboratory sections of his embryology course in the early years, he used a bulky carbon arc projector to show images on a screen of structures appearing in prepared slides, mostly cross sections of embryos. His routine in the laboratory was to have an initial orientation session using this instrument, followed by the students studying slides with individual microscopes and making drawings of the structures seen.

Newby enhanced his teaching by preparing teaching aids such as charts and models and especially laboratory manuals, which had elaborate drawings to depict the structures, organs, and organ systems. Not only did he prepare and publish laboratory manuals for his own classes, but the effort carried over to the general education classes as well. Since there were multiple sections of general biology being taught by many different instructors, the use of his manuals helped the writer coordinate the coverage by all instructors of certain proscribed subject matter.

The mechanism of reduction division as opposed to normal cell division was particularly difficult for students to visualize. Troublesome, too, were certain phenomena of hered-

ity such as crossing over. Dr. Newby, with the collaboration of a colleague in his department, Dr. George Lefevre, Jr., prepared "An Illustrated Introduction to Heredity and Development" (1954b). Portions of this were extracted and published for use in the general biology course.

The laboratory manuals that Newby prepared underwent various revisions over a period of many years under various titles (see 1956a, 1956b, 1964, 1965b). One deserves additional comment, namely, his "Guide to the Study of Development" (1960). Although this was designed for his course in embryology, it was actually a textbook in his specialized field. Seemingly, an earlier informal mimeographed version of this had appeared as early as 1953.

There are some tag ends concerning his writing and bibliography to note in passing. An early paper with student Perry Plummer, who later became a prominent field biologist with the U.S. Forest Service, described a technique for preparing microscopic sections of stems and roots. This was when Newby was teaching a course in microtechnique. A second item is an abstract (1950) of a paper he gave before the Utah Academy of Sciences discussing the recapitulation theory of development. Another was a joint paper (1965c) on the embryonic development of the California Gull. Dr. Newby's publications, listed chronologically at the end of this memorial, fall into four categories, namely, reports on his research, his laboratory manuals and supplements, the guides for premedical students, and articles dealing with historical aspects of the university, especially pertaining to research in the field of biology. Regarding those in the first two categories, his exquisite detailed drawings are especially noteworthy.

There are some miscellaneous items worthy of comment in connection with Dr. Newby's long and distinguished career. He was invited by George Lefevre to teach embryology and genetics at Harvard University as a visiting professor during the summer of 1963, and he continued to do so during the summers of 1964 and 1965. Bob Vickery had preceded Kim in the summer of 1961, teaching genetics there.

Kim was once asked how students at Harvard compared with those at Utah. He didn't

think they were more highly endowed intellectually, but they were "better read" and hence more knowledgeable. He attributed this to a cultural factor wherein reading was more traditional for eastern students, correlated with their having more free time to do so. In contrast, many students at Utah had to work while attending the university. Nevertheless, he thought that Utah students were better trained in mathematics and biology.

Kim was impressed with the Harvard custom of everyone being introduced as Mr. or Mrs. rather than by their academic title of Dr. or Professor. Another surprise was the standing ovation given him at the end of the course in appreciation for his instruction.

Newby influenced many students to become biologists—and not through proselytizing. Rather, their decisions were the subtle result of students desiring to emulate him. The best example is Stephen D. Durrant, who turned from studying languages to zoology and went on to become a reknowned mammalogist.

Another Newby quality was his gregariousness. A round table in a corner of the Panorama Room Restaurant in the student union was reserved for faculty. A certain group of professors that included Newby regularly met there for lunch. Many of these same people joined others for morning coffee in the faculty lounge, so Kim became conversant with university and faculty affairs. He was prominent in the affairs of the Aztec Club, an intellectual and social group that met monthly on campus. Membership consisted mostly of university people, but there were a few from downtown. Kim was vice-president in 1965-1966 and president in 1966-1967.

As a result of all these contacts, he became well known both on and off campus and was called upon many times by the administration for special assignments. For example, to celebrate the fifteenth anniversary of the founding of the graduate school, a special series of public lectures by distinguished scholars was arranged, and on 20 February 1961 a symposium on "Graduate Education: The Basis of Our Technical Society" was held. Newby gave one of the papers for this (1961a). It was titled "The Spirit of Research at the University." To commemorate the same occasion, a booklet was published called "The Advancement of

Learning: Fifteen Years of Graduate Instruction, Research, and Service at the University of Utah 1946-1961." For this Dr. Newby (1961a) prepared the chapter on the biological sciences.

When the old Biology Building on the lower campus was rechristened the James E. Talmage Building, after one of the early presidents of the institution, Dr. Newby was asked to tell the history of the building. Indeed, he had earlier been involved in selecting names among the university's presidents for all the buildings on the lower campus in the area that came to be known as the President's Circle.

All through the years Dr. Newby was closely associated with Sydney W. Angleman in the general education program, one feature of which was an orientation course for freshmen entering the university. A syllabus for this course was originally prepared by a committee under the editorship of Dr. Virginia P. Frobes. The third edition of the syllabus was edited by Dr. Newby, assisted by an advisory committee. This entailed an extensive rewriting. The first five chapters were written by Dr. Newby with subsequent modifications by others. The remainder of the syllabus was taken from earlier editions with minor changes.

Dr. Newby was a charter member of University of Utah chapters for two professional societies. The first was the Alpha Lambda Chapter of Phi Sigma Biological Society. The writer as a senior student happened to be president of the predecessor society when it "went national" and recalls how helpful Kim Newby was at the time of the installation ceremonies. Indeed, he and Beth were staunch supporters through all the years of the chapter's existence. The second was the Society of the Sigma Xi. Kim was one of the group of researchers who petitioned that a chapter be established at the University of Utah. He served on numerous committees through the years and one term as president of the local chapter for the 1963-1964 academic year.

Two high honors were bestowed on Dr. Newby by the university. In 1966 he was made an honorary alumnus of the College of Medicine in recognition of his many years of teaching premedical students and serving as premedical counselor. Steve Durrant was similarly honored at the same time. In 1971,

the last year of Newby's teaching, he was one of four professors selected by senior students to receive the prestigious Distinguished Teaching Award, as mentioned earlier. Two of many favorable comments made by these students on nomination forms were that he "makes difficult material clear" and "he is out to teach, not to outguess students." The award was presented to him at the annual commencement exercises, at which time the rank of professor emeritus in biology was conferred upon him.

That same year, shortly after his retirement, the older group among the members of the staff of the biology department solicited letters of appreciation from his colleagues, the administration, and as many of his former students as could be contacted. The person largely responsible for this was Bob Vickery. The letters received were then bound and presented to Dr. Newby. It became one of his treasured possessions. A significant sidelight in this connection is that one of the last things that Sid Angleman did on campus was to personally deliver to Bob Vickery his letter of appreciation for the book of letters. The next day Dean Angleman died following heart surgery. His death coming just prior to Kim's retirement affected Kim greatly. Subsequently, Kim instigated a movement to place a rock bearing a bronze memorial plaque along the south side of the east-west mall on the upper campus near the education building.

One of the inherent characteristics of Dr. Newby, as previously noted, was his ability to work with his hands. He shared this skill with his brother Gordon, who taught manual training and art at Highland High School in Salt Lake City for many years and on the side made many artifacts of wood such as cabinets, fireplace fronts, and carved statues. (Incidentally, Kim and Gordon looked remarkably alike.) Kim made about 20 small ornamental mahogany tables, 15 of which he gave to friends. Each was carved with a special design appropriate to the scholar. Later he made canes with wooden handles fitted specially to the grip of each recipient.

As sort of a sequel to this, during his six years after retirement, he volunteered many hours to the Marriott Library working on the preservation and restoration of early

manuscripts, published books, maps, and prints in the Special Collections Division of the Library. According to Dr. Everett Cooley, curator of this collection and university archivist, Dr. Newby contributed his own time to learn paper preservation. Indeed, Kim went to Harvard University one summer to learn the techniques at a special workshop. His subsequent work at Utah was invaluable in that he de-acidified and sealed in mylar envelopes hundreds of early maps and about 750 extremely valuable lithographs of American Indians from the Edward Curtis collection that had been purchased by the university. This made it possible for material to be handled by researchers that before had been too fragile to touch.

Kim's work on the preservation of rare and valuable items in the Marriott Library led to his being chosen in 1973 to serve on the board of directors of the Friends of the Library, an organization created to increase university and public awareness of the needs and achievements of the library. He served on the board two terms, during which time he played an important role in developing a significant Friends program. For his service to the library and Beth's volunteer work in cataloging manuscripts, they were both made Honorary Friends of the University of Utah Library.

Kim was also active in the Professors Emeriti Club and served one term as president during the 1973-1974 academic year. Beth also worked for many years as a volunteer in the Salt Lake City Public Library.

Dr. Newby was not a robust individual, but he had no physical problems either. Yet the subtle effects of many years of stress had taken its toll. In the spring of 1968 the premedical honor society Alpha Epsilon Delta was invited to hold its 17th annual national meeting at the University of Utah. Dr. Newby and the officers of the local chapter had the responsibility of making local arrangements and planning the program. Just prior to the meeting in the first week of April, Kim suffered a heart attack while at his home. The first action of the convention after it convened was to pass unanimously a resolution thanking Dr. Newby for the excellent arrangements he had made and wishing him a speedy recovery. After a stay in the hospital he was brought home on the very day that his colleague Bill Flowers died from a

heart attack. To recuperate, Kim determinedly followed a regimen involving walking at least three miles a day. This was often done at the university. He figured out how many times around the landing on the outside of the main floor of the new South Biology building (where he had his office) it took to constitute a mile, and then at noon around and around he would go until the three miles were covered. He also took up golf and played several times a week. Perhaps as a result of this regimen, he lived for nearly ten more years. The end came suddenly on the evening of 24 March 1977 at the Hotel Utah while he was the guest of Everett Cooley at a dinner meeting of the Timpanogos Club, another intellectual society of essentially prominent people downtown. After the lecture, during the discussion period, he suddenly slumped forward on the table without a sound. Although there were several doctors in the group, including some who had taken his classes as premedical students, he couldn't be revived. Thus ended his 74-year life span, his 50-year association with the University of Utah, his 44 years of teaching and research, and a long, productive, varied career. Memorial services were held at noon on 28 March 1977, with interment in the City Cemetery in Heber.

Dr. Newby was one of a triumvirate of scholars in diverse fields who were recruited by the University of Utah from institutions in other states all about the same time in the late 1920s. The others were Sydney W. Angelman, who initially taught English literature, and Jacob Geerlings, whose specialty area was Greek and Roman history. The three became fast friends, and their combined influence and academic leadership at the university for roughly four decades is incalculable. Dr. Angelman became dean of the lower division and thus built up and guided the general education program for many years, assisted by Newby and others. Dr. Geerlings served as the first dean of the faculty. Dr. Newby became head of the Department of Genetics and Cytology and eventually the elder statesman of the biology area.

In retrospect, William Wallace Newby was a model of perfection as a teacher. He made highly important contributions in his research in developmental embryology. He was a superb illustrator. He was an effective adminis-

trator. As a premedical counselor, he gave advice that was timely and realistic. Although not an alumnus of the University of Utah, no one could have been more loyal to or supportive of the institution. The university and his adopted state suffered a great loss with his passing.

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